

1. A method comprising:
piercing at least a muscle layer of stomach tissue with at least one curved wire, and
5 pulling the wire to move the stomach tissue.
2. The method of claim 1 wherein piercing includes rotating the wire.
3. The method of claim 1 wherein piercing includes translating the wire distally
10 along an axis.
4. The method of claim 3 wherein pulling the wire includes pulling the wire
proximally along the axis.
5. The method of claim 1 further comprising stabilizing the stomach tissue.
15
6. The method of claim 5 wherein stabilizing includes stabilizing with a sheath
surrounding the wire.
7. The method of claim 6 wherein stabilizing includes compressing the stomach
20 tissue with the sheath.
8. The method of claim 5 wherein stabilizing includes stabilizing with a needle.
9. The method of claim 8 wherein stabilizing includes positioning the needle within
25 a coil of the wire.
10. The method of claim 1 further comprising injecting a material into the stomach
tissue with a needle while the wire is piercing the tissue.

30

11. The method of claim 10 further comprising anchoring the needle with the wire to counteract pressure created by the material injection.

5 12. The method of claim 1 further comprising applying force to a drive shaft to cause the wire to move through the stomach tissue.

13. The method of claim 1 wherein piercing includes pivoting the wire about a pivot.

10 14. An apparatus comprising:
an elongated member configured for transoral placement into the stomach, and
a distal portion of the elongated member including two opposing curved wires
configured to engage stomach tissue such that retracting the elongated member pulls the
stomach tissue.

15 15. The apparatus of claim 14 wherein the wires include tissue piercing tips.

16. The apparatus of claim 14 wherein the wires are arcuately shaped.

20 17. The apparatus of claim 14 wherein the wires are made of a metal.

18. The apparatus of claim 14 wherein the wires are configured to pivot toward each other to engage the stomach tissue.

25 19. A method comprising:
advancing an apparatus transorally into the stomach, the apparatus including two
opposing curved wires,
engaging stomach tissue with the wires, and
pulling the engaged stomach tissue with the wires.

30

20. The method of claim 19 wherein engaging the stomach tissue includes pivoting the wires toward one another about a pivot axis.

5 21. The method of claim 20 wherein engaging includes penetrating the stomach tissue with tissue penetrating tips of the wires as the wires are pivoted toward one another.

22. The method of claim 19 wherein pulling the engaging stomach tissue includes pulling the wires.

10 23. A method comprising:
piercing a first element through a fold in stomach tissue from a first side of the fold from within the stomach, and
joining the first element with a second element on a second side of the fold to secure the fold.

15 24. The method of claim 23 further comprising pulling stomach tissue to form the fold.

20 25. The method of claim 23 wherein joining the first element with the second element includes advancing the first element through a hole in the second element.

25 26. The method of claim 25 wherein joining the first element with the second element includes applying a force to the first element after the first element is advanced through the hole.

27. The method of claim 26 wherein applying the force to the first element includes applying enough force to the first element to release the first element from a base.

30 28. The method of claim 23 wherein joining the first element with the second element includes receiving a suture through the first element.

29. A method comprising:
manipulating a plurality of regions of stomach tissue simultaneously from within the
stomach to place exterior surface regions of the stomach tissue in apposition.

5 30. The method of claim 29 wherein manipulating includes engaging the plurality
of regions of stomach tissue with a plurality of members.

31. The method of claim 30 wherein manipulating includes moving at least one of
the plurality of members.

10 32. The method of claim 30 wherein engaging includes piercing the plurality of
regions of stomach tissue with the plurality of members.

33. The method of claim 29 further comprising securing the exterior surface regions
15 of stomach.

34. The method of claim 33 wherein securing includes fixing the exterior surface
regions of the stomach to each other.

20 35. The method of claim 34 wherein fixing includes placing at least one tissue
fixation device through at least one full-thickness layer of the stomach.

36. The method of claim 33 wherein securing includes delivering a tissue fixation
device to the stomach tissue while the plurality of regions of stomach tissue are manipulated.

25 37. The method of claim 33 wherein manipulating includes pulling the plurality of
regions of stomach tissue into a tissue securing device and securing includes securing using
the tissue securing device.

30 38. The method of claim 29 wherein manipulating includes applying pressure to the
plurality of regions of stomach tissue.

39. The method of claim 29 wherein manipulating includes moving a full thickness of a region of stomach tissue.

5 40. The method of claim 29 wherein manipulating includes engaging a full thickness of a region of stomach tissue.

41. The method of claim 29 wherein manipulating includes wrapping stomach tissue around the gastroesophageal junction.

10

42. An apparatus comprising:

first and second jaws for engaging tissue, the jaws being configured such that the mechanical advantage increases as the jaws are closed.

15

43. The apparatus of claim 42 further comprising a yoke having a portion coupled to a slot in each of the jaws.

44. The apparatus of claim 43 wherein the yoke is coupled to an actuating member to cause the yoke to move along a yoke axis.

20

45. The apparatus of claim 44 wherein the jaws are configured such that as the yoke moves distally along the yoke axis, the yoke portion slides along the slots and causes the jaws to close.

25

46. The apparatus of claim 45 wherein the slots are shaped such that as the yoke moves distally along the yoke axis, the mechanical advantage increases.

47. The apparatus of claim 42 wherein each of the jaws includes an arm and a cartridge attached to the arm.

30

48. A method comprising:

engaging stomach tissue with a pair of coacting jaws from within the stomach, and
piercing the stomach tissue with at least one of the jaws.

5 49. The method of claim 48 wherein the at least one jaw includes an implant that
pierces the tissue.

50. The method of claim 49 wherein the at least one jaw includes a tissue piercing
element that delivers at least a portion of an implant.

10 51. The method of claim 48 wherein the jaws are configured to deploy an implant
into the stomach tissue.

52. The method of claim 48 wherein engaging stomach tissue includes placing parts
of a tissue fixation device coupled to the jaws in contact with the stomach tissue.

15 53. A method of treatment comprising:
engaging stomach tissue with a plurality of members from within the stomach,
followed by
moving at least one of the plurality of members to place exterior surface regions of
20 the stomach in apposition.

54. The method of claim 53 wherein engaging includes piercing the stomach tissue
with the plurality of members.

25 55. The method of claim 53 further comprising fixing the exterior surface regions of
the stomach to each other.

56. The method of claim 55 wherein fixing includes placing at least one tissue
fixation device through at least one full-thickness layer of the stomach.

30

57. The method of claim 55 wherein fixing includes delivering a tissue fixation device to the stomach tissue while the stomach tissue is engaged.

5 58. The method of claim 53 wherein engaging includes applying pressure to the stomach tissue.

59. The method of claim 53 wherein engaging includes pulling the stomach tissue into a tissue securing device.

10 60. The method of claim 59 further comprising securing the exterior surface regions using the tissue securing device.

61. A method of treatment comprising:
engaging stomach tissue with a plurality of members from within the stomach, and
15 moving the plurality of members to place exterior surface regions of the stomach in apposition.

62. The method of claim 61 wherein engaging includes piercing the stomach tissue with the plurality of members.

20 63. The method of claim 61 further comprising fixing the exterior surface regions of the stomach to each other.

64. The method of claim 63 wherein fixing includes placing at least one tissue fixation device through at least one full-thickness layer of the stomach.

25 65. The method of claim 63 wherein fixing includes delivering a tissue fixation device to the stomach tissue while the stomach tissue is engaged.

30 66. The method of claim 61 wherein engaging includes applying pressure to the stomach tissue.

67. The method of claim 61 wherein engaging includes pulling the stomach tissue into a tissue securing device.

5 68. The method of claim 67 further comprising securing the exterior surface regions using the tissue securing device.

69. An apparatus comprising:
an elongated member configured for transoral placement into the stomach, and
10 a distal end effector attached to the elongated member, the distal end effector including:
an element for engaging tissue and pulling the engaged tissue, and
an implant for securing tissue, the distal end effector being configured to
deploy the implant.

15 70. The apparatus of claim 69 wherein the elongated member includes an actuating assembly coupled to the distal end effector.

71. The apparatus of claim 69 wherein the element stabilizes the engaged tissue.

20 72. The apparatus of claim 69 wherein the element includes a curved wire.

73. The apparatus of claim 69 wherein the element includes a coil.

25 74. The apparatus of claim 69 wherein the element includes a needle.

75. The apparatus of claim 74 wherein the needle includes a hole for injecting matter into the tissue.

30 76. The apparatus of claim 69 wherein the distal end effector includes a pair of coacting jaws that are configured to deploy the implant.

77. The apparatus of claim 69 wherein the distal end effector includes a tissue piercing element that delivers at least a portion of the implant.

5 78. The apparatus of claim 69 wherein the implant pierces the tissue.

79. A method comprising:
advancing an apparatus transorally into the stomach, the apparatus including a distal
end effector,
10 engaging stomach tissue and pulling engaged stomach tissue with the distal end
effector, and
 deploying an implant with the distal end effector to secure stomach tissue.

80. The method of claim 79 further comprising stabilizing the engaged tissue with
15 the distal end effector.

81. The method of claim 79 wherein engaging stomach tissue includes piercing the
stomach tissue with a curved wire.

20 82. The method of claim 79 wherein engaging stomach tissue includes piercing the
stomach tissue with a coil.

83. The method of claim 79 further comprising injecting matter into the tissue with
the distal end effector.

25 84. The method of claim 79 wherein deploying the implant includes deploying the
implant with a pair of coacting jaws.

85. The method of claim 79 wherein deploying the implant includes piercing the
30 stomach tissue to deliver at least a portion of the implant.

86. The method of claim 79 wherein deploying the implant includes piercing the stomach tissue.

5 87. An apparatus comprising:
an elongated member configured for endoluminal insertion to a treatment site, and
a distal end effector including a retractor and a least one member, the retractor being
configured to engage tissue to pull tissue and the member being configured to manipulate
tissue to place exterior surface regions of the tissue in apposition.

10 88. The apparatus of claim 87 wherein the elongated member includes an actuating
assembly coupled to the distal end effector.

89. The apparatus of claim 87 wherein the retractor stabilizes the tissue.

15 90. The apparatus of claim 87 wherein the retractor includes a coil, a curved wire,
or a needle.

91. The apparatus of claim 87 wherein the member is configured to deploy an
implant to secure the tissue.

20 92. The apparatus of claim 87 wherein the member includes a tissue piercing
element.

25 93. The apparatus of claim 92 wherein the tissue piercing element delivers an
implant to the tissue.

94. The apparatus of claim 92 wherein the tissue piercing element is configured to
break away from the member to secure the tissue.

30 95. A method comprising:

advancing an apparatus into the stomach, the apparatus including a distal end effector having first and second members configured to engage stomach tissue, and pulling tissue between the first and second members.

5 96. The method of claim 95 wherein pulling the tissue includes stabilizing the tissue.

97. The method of claim 95 further comprising deploying an implant with the first and second members to secure the engaged stomach tissue.

10

98. The method of claim 95 wherein engaging the stomach tissue includes piercing the stomach tissue with the first member.

99. The method of claim 98 further comprising delivering a portion of an implant to
15 the stomach tissue with the first member.

100. The method of claim 99 wherein delivering the portion of the implant includes delivering the portion through a channel of the first member.

20 101. The method of claim 99 wherein delivering the portion of the implant includes applying enough force to the first member to release a portion of the first member from the first member.

25 102. A method of forming a fold in stomach tissue, the method comprising:
pulling stomach tissue from within the stomach, followed by
manipulating tissue in the vicinity of the pulled stomach tissue in such a way that
exterior surface regions of the stomach are placed in apposition.

103. The method of claim 102 wherein pulling the stomach tissue includes
30 stabilizing the tissue.

104. The method of claim 102 wherein manipulating the tissue includes piercing the tissue.

5 105. The method of claim 102 wherein manipulating includes engaging the tissue with a plurality of members.

106. The method of claim 105 wherein engaging includes moving at least one of the plurality of members.

10 107. The method of claim 105 wherein engaging includes piercing the tissue with at least one of the plurality of members.

108. The method of claim 102 further comprising securing the exterior surface regions of the stomach.

15

109. The method of claim 108 wherein securing includes fixing the exterior surface regions of the stomach to each other.

110. The method of claim 108 wherein securing includes delivering a tissue fixation device to the stomach tissue while the stomach tissue is manipulated.

20

111. The method of claim 102 wherein manipulating includes applying pressure to the tissue.

25

112. A method comprising:
advancing an apparatus into the stomach, the apparatus including a distal end effector having first and second members configured to engage stomach tissue,
engaging stomach tissue with the first and second members, and
deploying an implant into the stomach tissue while the first and second members are
30 engaging the stomach tissue.

113. The method of claim 112 wherein engaging includes moving the first and second members toward each other.

5 114. The method of claim 112 wherein engaging includes piercing the stomach tissue with the first member.

115. The method of claim 112 wherein deploying the implant includes piercing at least a portion of the implant through the stomach tissue from within the stomach.

10 116. The method of claim 112 further comprising pulling the stomach tissue between the first and second members.

117. A method comprising:
advancing an apparatus into the stomach, the apparatus including a distal end effector
15 having a member with a portion configured to pierce stomach tissue,
piercing stomach tissue with the portion of the member, and
deploying an implant through the stomach tissue, the implant being guided by the
portion of the member.

20 118. The method of claim 117 wherein deploying the implant includes guiding the implant through a channel of the member portion.

119. The method of claim 117 wherein the distal end effector includes another member, wherein deploying the implant includes guiding a portion of the member through an
25 opening of the other member.

120. A method comprising:
advancing an apparatus into the stomach, the apparatus including a distal end effector
having a member with a portion configured to pierce stomach tissue,
30 piercing stomach tissue with the portion of the member, the portion of the member
creating a path through the stomach tissue, and

passing a portion of an implant through the path.

121. The method of claim 120 further comprising passing the portion of the implant through an opening of another portion of the member.

5

122. The method of claim 121 further comprising passing the portion of the implant through another portion of the implant coupled to the other member portion.

10

123. The method of claim 122 further comprising deploying the implant including locating the implant portion on an exterior side of the other implant portion.

124. The method of claim 120 wherein passing the implant portion includes passing the implant portion through a channel within member portion.

15

125. An apparatus comprising:
an elongated member configured for transoral placement into the stomach, and
a distal end effector attached to the elongated member, the distal end effector having
a first configuration with a profile for transoral placement into the stomach and a second
configuration with a larger profile, the distal end effector including:

20

an element configured to pull tissue, and
an implant configured to secure tissue.

126. The apparatus of claim 125 wherein the element comprises a curved wire.

25

127. The apparatus of claim 125 wherein the element comprises a coil.

128. The apparatus of claim 125 wherein the distal end effector is configured to deploy the implant.

30

129. The apparatus of claim 128 wherein the distal end effector includes a tissue piercing element that delivers at least a portion of the implant.

130. The apparatus of claim 125 wherein the distal end effector includes a pair of coacting jaws.

5 131. The apparatus of claim 130 wherein the jaws are configured to deploy the implant.

132. The apparatus of claim 130 wherein the jaws have a closed position corresponding to the profile for transoral placement.

10 133. The apparatus of claim 130 wherein the jaws have an open position corresponding to the larger profile.

134. An apparatus comprising:
15 an elongated member configured for transoral placement into the stomach, and
 a distal end effector attached to the elongated member, the distal end effector having
 a first configuration with a profile for transoral placement into the stomach and a second
 configuration with a larger profile, the distal end effector including:
 means for pulling tissue, and
20 means for securing tissue.

135. The apparatus of claim 134 wherein the means for pulling tissue comprises a curved wire.

25 136. The apparatus of claim 134 wherein the means for pulling tissue comprises a coil.

137. The apparatus of claim 134 wherein the means for securing tissue comprises a two-part fastener

30 138. A method comprising:

advancing an apparatus transorally into the stomach with a distal end effector of the apparatus in a first configuration,

moving the distal end effector when located in the stomach into a second configuration having a larger profile than the first configuration,

5 pulling tissue with the distal end effector, and
securing tissue.

139. The method of claim 138 wherein pulling tissue comprises pulling stomach tissue.

10

140. The method of claim 138 wherein securing tissue comprises securing tissue with an implant.

141. The method of claim 140 wherein securing tissue comprises deploying the
15 implant with the distal end effector.

142. The method of claim 141 wherein deploying the implant includes piercing the tissue.

20 143. The method of claim 141 wherein deploying the implant includes deploying the implant with a pair of coacting jaws.

144. The method of claim 138 wherein moving the distal end effector comprises opening a pair of coacting jaws.

25

145. The method of claim 138 wherein securing tissue comprises securing stomach tissue.

30 146. The method of claim 138 wherein pulling tissue includes piercing the tissue with a curved wire.

147. The method of claim 138 wherein pulling tissue includes piercing the tissue with a coil.